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Indian Standard
**SPECIFICATION FOR
ALUMINIUM FOILSTOCK**

(First Reprint DECEMBER 1997)

UDC 669.71-416

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BUREAU OF INDIAN STANDARDS
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Indian Standard

SPECIFICATION FOR ALUMINIUM FOILSTOCK

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Indian Standard

**SPECIFICATION FOR
ALUMINIUM FOILSTOCK**

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 23 August 1982, after the draft finalized by the Metals and Their Alloys Sectional Committee had been approved by the Structural and Metals Division Council.

0.2 In view of the rapid development in the application of aluminium foils, as wrapping and packaging material for a wide range of commodities, need was felt to prepare a standard for aluminium foilstock, used for manufacturing foils. This standard has been prepared to rationalize the requirement of foilstock taking the manufacturing and trade practices, existing in the country, into consideration.

0.3 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard covers the requirements of wrought aluminium foilstock.

2. TERMINOLOGY

2.0 For the purpose of this standard, the following definition, in addition to those given in IS : 5047 (Parts I to III)†, shall apply.

*Rules for rounding off numerical values (*revised*).

†Glossary of terms relating to aluminium and aluminium alloys:

Part I Unwrought and wrought metals (*first revision*).

Part II Plant and operation, thermal treatment, control, testing and finishing (*first revision*).

Part III Geometrical properties and tolerance, structural and surface defects.

2.1 Foilstock — Semi-finished coiled strip for further rolling to foil.

3. SUPPLY OF MATERIALS

3.1 General requirements for the supply of aluminium products shall conform to IS : 1387-1967*.

3.2 Temper — The material shall be supplied in fully annealed 'O' temper. If required by the purchaser, the material may be supplied in any other temper, as mutually agreed between the manufacturer and the purchaser.

4. FREEDOM FROM DEFECTS

4.1 The metal shall be commercially free from defects likely to give rise either to excessive breaks or pinholing when rolled to lower foil gauges by the correct practice.

4.2 The grain size of foilstock, at the annealed temper, should be uniformly small. The exact value of the grain size should be agreed to between the supplier and the purchaser at the time of placing the order.

4.3 The surface shall be commercially free from all harmful defects, such as, rolled-in-dirt, roll coating, burnt oil stains, water stains or corrosion or mechanical damage.

4.4 The coils shall be free from buckles, pinch marks and wavy edges.

4.5 The coils shall be supplied cleanly trimmed, free from edge cracks and block edge effects.

4.6 The coils edges shall be free from 'belling' tendency.

4.7 The coil shall be free from 'breaks'.

4.8 The coils shall be properly wound without telescoping.

5. CHEMICAL COMPOSITION

5.1 The chemical composition of foilstock shall conform to the following limits:

Fe, percent	0·25-0·6
Si, percent	0·10-0·2
Cu, percent	0·02 <i>Max</i>
Mn, percent	0·02 <i>Max</i>

*General requirements for the supply of metallurgical materials (*first revision*).

Mg, percent	0·01 <i>Max</i>
Zn, percent	0·03 <i>Max</i>
Al, percent	99·2 <i>Min</i>
Fe:Si ratio	2·5 : 1 <i>Min</i>

5.1.1 The chemical composition shall be determined either by the method specified in IS : 504-1963* or any other instrumental/chemical method. In case of dispute, the procedure given in the latest edition of IS : 504 shall be the referee method.

6. MECHANICAL PROPERTIES

6.1 Tensile Test — The tensile test shall be carried out in accordance with IS : 1816-1979† on the test pieces prepared from test samples selected as specified in 7. The values obtained shall comply with the following requirements:

<i>Temper</i>	<i>Tensile Strength, MPa</i>	<i>Elongation on 50 mm</i>
O	95 <i>Max</i>	27 percent, <i>Min</i>

NOTE — 1 MPa = 1 N/mm² = 0·102 kgf/mm².

7. SELECTION OF TEST SAMPLES

7.0 The test samples shall be selected as specified in 7.1. Before the test samples are cut off, they shall be marked to identify them with the lot they represent.

7.1 Foilstock of the same width and thickness, of the same grade and manufactured under similar conditions shall be grouped into lots weighing up to 2 000 kg or part thereof and one test sample shall be selected from each lot.

8. DIMENSIONS AND TOLERANCES

8.1 Thickness — The nominal thickness of foilstock shall be mutually agreed between the supplier and the purchaser, but it should be within the range of 0·4-0·8 mm. The suggested thicknesses are 0·4, 0·45, 0·55, 0·6 and 0·8 mm.

8.1.1 The tolerances on nominal thickness of foilstock shall be as follows:

<i>Specified Thickness (mm)</i>	<i>Tolerance (mm)</i>
0·40-0·65	+ 0·03-0·03
0·66-0·80	+ 0·04-0·05

*Methods of chemical analysis of aluminium and its alloys (*revised*).

†Tensile test for light metals and their alloys.

8.1.2 On individual coils the thickness variation shall not show sudden changes and shall not exceed the following limits:

<i>Foilstock Thickness (mm)</i>	<i>Deviation in Transverse Direction (mm)</i>	<i>Deviation in Longitudinal Direction (mm)</i>
0·40-0·65	± 0·01	± 0·014
0·66-0·80	± 0·015	± 0·020

8.2 Width — The width of the foilstock shall be mutually agreed between the supplier and the purchaser.

8.2.1 The tolerance on all widths of foilstock shall be ± 1·2 mm, unless otherwise specified.

8.3 Coil Diameter — The outside diameter of coils of foilstock shall be between 650 mm and 2 000 mm, and the inside diameter shall be 200 mm, 300 mm or 500 mm.

8.4 Coil Density — The coil density of the foilstock coil shall be 1·1-2·5 kg/mm of width. Foilstocks with a coil density less than 1·1 may be supplied subject to agreement between the purchaser and the supplier.

9. RETESTS

9.1 Should any one of the test pieces first selected fails to conform to the mechanical test, two further samples from the same lot shall be selected for testing, one of which shall be from coil from which the original test sample was taken, unless that has been withdrawn by the supplier.

9.2 Should the test pieces from both these additional samples conform to the values prescribed, the lot represented by the test samples shall be deemed to comply with the requirements of mechanical properties. Should the test piece from either of these additional samples fail, the lot represented by the test samples shall be liable to rejection.

10. PACKING AND MARKING

10.1 Coils of foilstock should be wrapped with a suitable waterproof material to prevent corrosion and should be otherwise wrapped and secured to prevent slippage.

10.2 If required foilstock may be suitably marked for identification, with the name of the manufacturer, grade, condition, width, thickness and gross and net weights of the material. The supplier shall furnish a certificate that the material supplied complies with the requirements of this specification.

10.2.1 The material may also be marked with the Standard Mark.

10.2.2 The use of the Standard Mark is governed by the provisions of Bureau of Indian Standards Act, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

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